

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

**In the Claims:**

Please amend claims as follows:

Claim 1. (Currently amended) An improved apparatus for ground support rotatable by rotation means, said improved apparatus adapted for insertion into a drilled hole penetrating a rock face, the improved apparatus comprising:

- a. a tensionable reinforcing member comprising:
  - i. a longitudinal axis;
  - ii. a diameter;
  - iii. a first end threaded portion having a free end and a first length, wherein said first end threaded portion extends out of said drilled hole;
  - iv. a second end ribbed portion having a second length, wherein said second length of said second end ribbed portion is adapted for total placement within the drilled hole;
  - v. at least one first bore, wherein said at least one first bore has a diameter and an inside surface, and wherein the at least one first bore is positionable intermediate of the said first length of the first end threaded portion, and wherein the at least one first bore transverses the diameter of the first end threaded portion, and further wherein the at least one first bore is perpendicular to said longitudinal axis;

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

b. at least one nut threadably receivable by the tensionable reinforcing member

first end threaded portion, said at least one nut having a body, said body

comprising:

- i. a squared portion having an axis, a first axial length, and a first width,  
wherein said squared portion is adapted to engage said rotation means;
- ii. ~~at~~ a convex hemispherical portion, adjacent to, coaxial with and integral  
to said squared body portion wherein the convex hemispherical portion  
permits installation of the tensionable reinforcing member when said  
rock face is uneven;
- iii. a second bore having a diameter, wherein said second bore extends co-  
axially through the squared portion and said hemispherical portion of  
the at least one nut body, wherein said second bore is adapted for  
threaded engagement with the first end threaded portion of the  
tensionable reinforcing member;
- iv. at least one third bore having a diameter equal to the diameter of the at  
least one first bore and an inside surface, said at least one third bore  
transversing the squared portion of the at least one nut body, the at least  
one third bore positioned intermediate of the axial length of the squared  
portion of the at least one nut body, and further wherein the at least one  
third bore and the at least one first bore are axially alignable when the at  
least one nut body is engaged with the first end threaded portion of the  
tensionable reinforcing member;

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

- c. at least one bearing plate used in combination with the at least one nut, said at least one bearing plate having a central domed portion and a circular aperture positioned centrally within said central domed portion, wherein the at least one bearing plate is adapted for placement upon the first end threaded portion of the tensionable reinforcing member, and wherein the at least one bearing plate is positionable between the rock face and the at least one nut convex hemispherical portion so that the central domed portion is adjacent to and in confronting relation to the at least one nut convex hemispherical portion, and further wherein said central domed portion circular aperture is adapted for pivoting engagement with the convex hemispherical portion of the at least one nut thereby permitting use of the improved apparatus on uneven rock faces; and
- d. at least one shearing element capable of shearing comprising a rolled spring member manufactured from carbon steel adapted to shear at a predetermined torque<sub>shear</sub>, said at least one shearing element placed within the axially aligned at least one first bore and at least one third bore thereby temporarily fixing the at least one nut adjacent to said free end of the first end threaded portion of the tensionable reinforcing member, and further wherein the rolled spring member fails consistently at said predetermined torque<sub>shear</sub>.

Claim 2. (Cancelled)

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

Claim 3. (Currently amended) The improved apparatus ~~as claimed in~~ of claim 2-1 where in the at least one nut body includes a circumferential shoulder between the squared portion of the at least one nut and the convex hemispherical portion of the at least one nut, said circumferential shoulder adapted to abut against the rotation means.

Claim 4 (cancelled).

Claim 5 (Currently amended). The improved apparatus of claim ~~4~~ 3, wherein the squared portion of the at least one nut body is sufficiently dimensioned so that the at least one third bore does not degrade the strength of the at least one nut body.

Claim 6 (Original). The improved apparatus of claim 5 wherein the at least one nut has a first pre-torque<sub>shear</sub> temporary operation position adjacent to the free end of the first end threaded portion of the tensionable reinforcing member.

Claim 7 (Currently Amended). The improved apparatus of claim 6 wherein the at least one nut has a second post-torque<sub>shear</sub> permanent operating position located adjacent to the rock face.

Claim 8 (Original). The improved apparatus of claim 7 wherein the at least one nut has a third torque<sub>max</sub> position located adjacent to the rock face and adapted for the transmission of tensile forces into the tensionable reinforcing member.

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

Claim 9 (Currently Amended). The improved apparatus of claim 8 wherein the rotation means engages the at least one nut in ~~its~~ said first pre-torque<sub>shear</sub> temporary operation position, and wherein the rotation means applies torque<sub>shear</sub> to the nut thereby failing the shearing element, thereby permitting the nut to advance from ~~it's~~ the first pre-torque<sub>shear</sub> temporary operation position to ~~its~~ said second post-torque<sub>shear</sub> permanent operation position.

Claim 10. (Cancelled).

Claim 11. (Currently amended) The improved apparatus as claimed in claim 10 ~~10~~ 1, wherein said rolled spring member has a variable diameter, and wherein the rolled spring member has:

- a. a first unbiased state having a first unbiased state diameter, wherein said first unbiased diameter is larger than the diameter of the aligned at least one first bore and the at least one third bore;
- b. a second fully biased state having a second fully biased state diameter, wherein said second fully biased state diameter is smaller than the diameter of the aligned at least one first bore and the at least one third bore, so that the rolled spring member can be inserted completely into the aligned at least one first bore and the at least one third bore; and,

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

- c. a third partially biased state having a third partially biased state diameter, wherein said third partially biased state diameter expands to fill the aligned at least one first bore and at least one third bore, and further wherein the rolled spring member exerts a biasing force against the inside surface of the aligned at least one first bore and the at least one third bore.

Claim 12 (Cancelled).

Claim 13 (Currently amended). The improved apparatus ~~as claimed in of claim 12~~ 11 wherein the rolled spring member is able to consistently shear at a predetermined torque<sub>shear</sub> ~~without fracturing and creating hazardous shards that could injure workers.~~

Claim 14 (Cancelled).

Claim 15 (Cancelled).

Claim 16 (Cancelled).

Claim 17 (Cancelled).

Claim 18 (Cancelled).

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

Please add the following new claims.

Claim 19 (New). An improved apparatus for ground support rotatable by rotation means, said improved apparatus adapted for insertion into a drilled hole penetrating a rock face, the improved apparatus comprising:

- a. a tensionable reinforcing member comprising:
  - i. a longitudinal axis;
  - ii. a diameter;
  - iii. a first end threaded portion having a free end and a first length, wherein said first end threaded portion extends out of said drilled hole;
  - iv. a second end ribbed portion having a second length, wherein said second length of said second end ribbed portion is adapted for total placement within the drilled hole;
  - v. at least one first bore, wherein said at least one first bore has a diameter and an inside surface, and wherein the at least one first bore is positionable intermediate of said first length of the first end threaded portion, and wherein the at least one first bore transverses the diameter of the first end threaded portion, and further wherein the at least one first bore is perpendicular to said longitudinal axis;
- b. at least one molded flange nut threadably receivable by the tensionable reinforcing member first end threaded portion, said at least one molded flange nut comprising:
  - i. a squared portion adapted to engage said rotation means;

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

- ii. a beveled flanged portion adjacent to said squared portion and adapted to exert pressure against said rock face;
  - iii. a circumferential beveled shoulder between said beveled flange portion and the squared portion, wherein said circumferential beveled shoulder is adapted to abut against the rotation means;
  - iv. a second bore having a diameter and extending co-axially through the at least one molded flange nut, said second bore adapted for threaded engagement with the first end threaded portion of the tensionable reinforcing member; and,
  - v. at least one third bore located in the squared portion of the at least one molded flange nut intermediate the axial length thereof and transversing the square portion;
- c. at least one flat bearing plate used in combination with the at least one molded flange nut, said at least one flat bearing plate having a circular aperture positioned centrally there within, wherein the at least one flat bearing plate is adapted for placement upon the first end threaded portion of the tensionable reinforcing member between the rock face and the at least one molded flange nut; and,
- d. at least one shearing element comprising a rolled spring member manufactured from carbon steel and having a variable diameter and adapted to shear at a predetermined torque<sub>shear</sub>, wherein the at least one shearing element is placed within the axially aligned at least one first bore and at least one third bore thereby temporarily fixing the at least one molded flange nut adjacent to said free end of the first end threaded portion of the tensionable reinforcing member, and further wherein the rolled spring member fails consistently at a predetermined torque<sub>shear</sub>.



Appn. Number 10/727,484

Rock Mongrain

GAU 3673

Claim 20 (New). In an improved apparatus for ground support rotatable by rotation means, said improved apparatus adapted for insertion into a drilled hole penetrating a rock face, the improved apparatus comprising:

- a. a tensionable reinforcing member comprising:
  - i. a longitudinal axis;
  - ii. a diameter;
  - iii. a first end threaded portion having a free end and a first length, wherein said first end threaded portion extends out of said drilled hole;
  - iv. a second end ribbed portion having a second length, wherein said second length of said second end ribbed portion is adapted for total placement within the drilled hole;
  - v. at least one first bore, wherein said at least one first bore has a diameter and an inside surface, and wherein the at least one first bore is positionable intermediate of said first length of the first end threaded portion, and wherein the at least one first bore transverses the diameter of the first end threaded portion, and further wherein the at least one first bore is perpendicular to said longitudinal axis;
- b. at least one nut threadably receivable by the tensionable reinforcing member first end threaded portion; said at least one nut having a body, said body comprising:

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

- i. a squared portion having an axis, a first axial length, and a first width, wherein said squared portion is adapted to engage said rotation means;
- ii. an convex hemispherical portion, adjacent to, coaxial with and integral to said squared portion wherein the convex hemispherical portion permits installation of the tensionable reinforcing member when said rock face is uneven;
- iii. a second bore having a diameter, wherein said second bore extends co-axially through the squared portion and said hemispherical portion of the at least one nut body, wherein said second bore is adapted for threaded engagement with the first end threaded portion of the tensionable reinforcing member;
- iv. at least one third bore having a diameter equal to the diameter of the at least one first bore and an inside surface, said at least one third bore transversing the squared portion of the at least one nut body, the at least one third bore positioned intermediate of the axial length of the squared portion of the at least one nut body, and further wherein the at least one third bore and the at least one first bore are axially alignable when the at least one nut body is engaged with the first end threaded portion of the tensionable reinforcing member;

Appn. Number 10/727,484

Rock Mongrain

GAU 3673

- c. at least one bearing plate used in combination with the at least one nut, said at least one bearing plate having a central domed portion and a circular aperture positioned centrally within said central domed portion, wherein the at least one bearing plate is adapted for placement upon the first end threaded portion of the tensionable reinforcing member, and wherein the at least one bearing plate is positionable between the rock face and the at least one nut convex hemispherical portion so that the central domed portion is adjacent to and in confronting relation to the at least one nut convex hemispherical portion, and further wherein said central domed portion circular aperture is adapted for pivoting engagement with the convex hemispherical portion of the at least one nut thereby permitting use of the improved apparatus on uneven rock faces; and,

an improved shearing element comprising a rolled spring member manufactured from carbon steel adapted to shear at a predetermined torque<sub>shear</sub>, said at least one shearing element placed within the axially aligned at least one first bore and at least one third bore thereby temporarily fixing the at least one nut adjacent to said free end of the first end threaded portion of the tensionable reinforcing member, and further wherein the rolled spring member fails consistently at said predetermined torque<sub>shear</sub>.